TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT

NON-DESTRUCTIVE ASSAY OF LARGE BURIED CONTAINERS

Identification No.: RL-MW029
Date: October 2001

Program: Waste Management
OPS Office/Site: Richland Operations Office/Hanford Site
PBS No.: RL-CP02
Waste Stream: M91G
TSD Title: TBD
Operable Unit (if applicable): N/A
Waste Management Unit (if applicable): N/A
Facility: M-91 Facility

Priority Rating:

This entry addresses the "Accelerated Cleanup: Paths to Closure (ACPC)" Priority:

____ 1. Critical to the success of the ACPC
_X_ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high lifecycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays)
____ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

***Need Title*:** Non-Destructive Assay (NDA) of Large Buried Containers

Need/Opportunity Category: *Technology Need* -- There is no existing or currently identified technology capable of solving the site's problem (i.e., technology gap exists, no baseline approach has been identified).

Need Description: Develop the ability to assay large, up to 20 ft in length, suspect TRU containers before retrieval to determine if their Pu content is low enough to reclassify them as Low Level Waste (LLW). Doing so would be a significant cost savings over processing them first and then declaring them LLW.

For any decisions relative to leaving waste in place, the inventory of TRU will be a significant driver in the decision process and will be required for a defensible position. Because this waste was generated and placed in the burial grounds 15 to 30 years ago, significant uncertainties exist relative to actual Pu content. The definition used for TRU before 1982 was 10 nCi/g, and currently it is 100 nCi/g. Therefore, many packages may be listed as TRU when in fact they contain less than the current limit. Because the older records/assay methods would most likely be considered suspect in today's regulatory

environment, actual assay using current technology would be a significant factor in justifying leaving in place as LLW.

Schedule Requirements:

Earliest Date Required: 2007

Latest Date Required: 2013

Technology needs to be established between end of FY 2007 (conceptual design start) and 2013 (start of operations), to support the M-91 facility baseline.

***Problem Description*:** Because these large containers were generated and placed in the burial grounds 15 to 30 years ago, significant uncertainties exist relative to actual Pu content. The definition used for TRU before 1982 was 10 nCi/g, and currently it is 100 nCi/g. Therefore, many packages may be listed as TRU when in fact they contain less than the current limit. Because the older records/assay methods would most likely be considered suspect in today's regulatory environment, actual assay using current technology would be a significant factor in justifying leaving in place as LLW. Also, if it is desired to develop a case for leaving a known waste package in place for ALARA reasons (failing container, too big, etc.), it is anticipated that the old records would also not be sufficient to support a favorable final decision from the regulators. Assay would again be a significant factor in building the case to leave in place. In addition, any waste that can be left in place will result in a reduction of waste to be processed and therefore represent an operational cost savings. Lastly, to support the burial ground performance assessment (PA), the total quantity of TRU left would be required, and NDA using current technology is expected to be required to adequately define that quantity.

Potential Life-Cycle Cost Savings of Need (in $000s) and Cost Savings Explanation: At this point in project definition, formal estimation of cost savings has not been made, but any reduction in processing is expected to save a significant amount of operational costs up to $5,000K.

Benefit to the Project Baseline of Filling Need: Reduction in operational costs and overall dose to workers (ALARA). In addition, the potential exists to reduce the overall size of the processing facility if a method existed to reclassify a significant amount of this waste.

Relevant PBS Milestone: A2G-08-109 M-91-15 Complete Acquisition of Facilities and Initiate Treatment of RH and Large Container (CH) LLMW

Functional Performance Requirements: Provide a method of non-destructive assay that can confirm the Pu content of buried large containers.

***Work Breakdown Structure (WBS) No.*:**	***TIP No.:***
1.2.2	N/A

***Justification For Need*:**

Technical: For any decisions relative to leaving waste in place, the inventory of TRU will be a significant driver in the decision process and will be required for a defensible position. Because this waste was generated and placed in the burial grounds 15 to 30 years ago, significant uncertainties exist relative to actual Pu content. The definition used for TRU before 1982 was 10 nCi/g, and currently it is 100 nCi/g. Therefore, many packages may be listed as TRU when in fact they contain less than the current limit. Because the older records/assay methods would most likely be considered suspect in today's regulatory environment, actual assay using current technology would be a significant factor in justifying leaving in place as LLW.

Regulatory: The definition used for TRU before 1982 was 10 nCi/g, and currently it is 100 nCi/g. Therefore, many packages may be listed as TRU when in fact they contain less than the current limit. Because the older records/assay methods would most likely be considered suspect in today's regulatory environment, actual assay using current technology would be a significant factor in justifying leaving in place as LLW.

Environmental Safety & Health: Any reduction in processing will result in less risk of exposure and a reduction of dose to operators (ALARA).

Cultural/Stakeholder Concerns:

Other: None identified.

Current Baseline Technology: N/A

End-User: Waste Management

Contractor Facility/Project Manager: TBD

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